

BUKRINSKAYA, A. G.; AZADOVA, N. B.; GIL'MAN, A. K.; VORKUNOVA, G. K.

"Nekotorye zakonomernosti reproduksii rnk-miksovirusov."

report presented at Symp on Virus Diseases, Moscow, 6-9 Oct 64.

Institut virusologii im D. I. Ivanovskogo AMN SSSR, Moskva.

BUKRINSKAYA, A.G.; GITEL'MAN, A.K.; VORKUNOVA, G.K.

Early proteins of myxoviruses. Vop. virus. 9 no.5:569-575
S.-O '64. (MIRA 18:6)

1. Institut virusologii imeni Ivanovskogo AMN SSSR, Moskva.

NIKOLSKAYA, A.I.; GEFU'MAN, A.K.; BLUMENFELD, L. 1961 TEL-FAN (48n
[Ref-000])

Effect of histones on the reproduction of the tobacco etch
virus. 19 pp. 66720-726 N-D '66 (1966 19.1)

1411

S/103/61/022/009/014/014
D206/D304

26.2190

AUTHORS: Gitelman, A.L., Syrodov, V.M. (Leningrad)

TITLE: The effect of leakages on the performance of a pneumatic unit of power compensation

PERIODICAL: Avtomatika i telemekhanika, v. 22, no. 9, 1961,
1257 - 1261

TEXT: In the present article, the authors present a generalized aspect of a certain problem experienced during the factory adjustment of a system of automatic control with a power compensating unit working at a pressure of 10 at, the diagram of which is shown in Fig. 1. The principle of its operation is based on the compensation of command force Q_k by force Q_m resulting at the membrane from the air pressure p in chamber A. By considering the balancing of forces, the static characteristics of power compensating unit can be drawn for ideal conditions (no leakages, all contacts can be hermetically closed) where Q_s - force acting on the valve from

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The effect of leakages on ...

the power air side, equal to the force exerted by the spring and to the difference of pressure across the valve. Q_{sp} is the force with which the valve is pressed against the collar. When there is a leakage between the valve and collar, the valve is pressed against it, but the power air is continuously being introduced into chamber A and with a change in the force Q_k , the gap between the nozzle and the valve changes so as to produce in A a pressure p satisfying the required balancing of forces. Since in this case the nozzle is not in contact with the valve, the force Q_s does not come into the balance, which this is independent of the change in the direction of force Q_k . The static characteristic for this case is shown in Fig. 3a. When there is a leakage between the valve and the nozzle, the latter is pressed against the valve, but air in the chamber A is continuously escaping into the atmosphere and with a change in the force Q_k , the necessary forces balance is obtained by the change in the gap between the valve and collar. Moreover, after

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the valve leaves the collar, there is a continuous contact between the nozzle and the valve under force Q_s (section CB, Fig. 3b). The leakage may also exist simultaneously at the collar and the nozzle, and the characteristic is in this case determined by the ratio of effective cross section areas formed between the valve, collar and nozzle. With all cross sections comparable in magnitude, the characteristic will consist of two sections OA and CB (Fig. 3c) and it follows that it may have a region of little or no sensitivity in the same manner as for ideal contacts, although their respective origins differ. Numerous experiments with a pneumatic sensing device having nozzles and collars of metals of various degrees of hardness, shape and diameter ratios at pressures p_0 and p up to 10 at) have shown that no perfect sealing can be achieved simultaneously at both sealing surfaces. During those experiments it was established that not only the shape, but also the stability of characteristics of the pneumatic unit depend on the relative ratios of leakages. This shows first of all in cases when the characteris-

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The effect of leakages on the

tic has a region of insensitivity within the operating range, i.e. for $0 < p < p_0$; the values p and Q_k which correspond to this region and also its shape varies from one measurement to another without any apparent reason. The static characteristic P of S is given of an experimental pneumatic command device for different ratios of respective leakages within the unit. Here S is the compression force of the spring. The command force $Q_k = cS$, where c is stiffness of the spring. In experiments $c = 1.76$ kg/mm, the pressure of actuating air $p_0 = 10$ at. It has also been found that in general, the leakage through the collar should if possible predominate over that into the atmosphere. There are 4 figures.

SUBMITTED: February 23, 1960

Card ~~1/1~~

KURZON, Ananiy Grigor'iyevich, doktor tekhn.nauk, prof.; LITAVRIN, Oleg Grigor'iyevich, inzh.; PETROV, Yevgeniy Valerianovich, inzh.; POTYAYEV, Vyacheslav Andreyevich, kand. tekhn.nauk; KHOMOZYANTS, Aleksandr Georgiyevich, kand. tekhn.nauk; CHERTKOV, Aleksandr L'vovich, Laureat Leninskoy premii; YUTKEVICH, Rostislav Mikhaylovich, inzh.; KOISEYEV, A.A., doktor tekhn.nauk, prof., retsenzent; MASLOV, A.A., kand. tekhn. nauk, dots., retsenzent; ZAYTSEV, Yu.I., kand. tekhn. nauk, retsenzent; KOZHEVNIKOV, A.V., kand. tekhn.nauk, retsenzent; GITEL'MAN, A.I., inzh., retsenzent; SMIRNOV, Yu.I., red.; TSAL, R.K., tekhn. red.

[Marine steam and gas turbines] Sudovye parovye i gazovye turbiny. Pod red. A.G.Kurzona. Leningrad, Sudpromgiz. Vol.2. [Systems and working principle of turbomachinery units] Sistemy i ustroistva turboagregatov. 1962. 419 p.

(MIRA 15:11)

(Marine turbines)

VINNER, M.G.; GITEL'MAN, G.Ya.

X-ray diagnosis of broncholithiasis. Vest. rent. 1 rad. 39
no.3:3-6 My-Je '64. (MIRA 18:11)

1. Otdeleniye legochnoy khirurgii (rukovoditel' - doktor
med. nauk M.L.Shulutko) Sverdlovskogo nauchno-issledovatel'-
skogo instituta tuberkuleza i zhelezodorozhnaya bol'nitsa.

GITEL'MAN, L.

Tashkent; city transportation routes as of June 1, 1957] Tashkent;
spravochnik marshrutov gorodskogo transporta, po sostoiianiiu na 1-oe
iiunia 1957 g. Tashkent, Izd. Reklamno-spravocnoi kontory, 1957:
111 p. (MLWA 10:10)

(Tashkent--Transportation)

LITVIN, D.M.; GITEI'MAN, L.Sh.

Automatically controlled IAll pug mills. Lit. proizv. no.9:29-32
S '61. (MIRA 14:9)
(Mixing machinery) (Automatic control)

LITVIN, D.M.; GITEL'MAN, L.S.

The 1all mixing mulling machines. Biul.tekh.--ekon.inform.

no.7 30-32 '61.

(MIRA 14:8)

(Molding machines)

LITVIN, D.M.; GITEL'MAN, L.Sh.

Automated ~~tum~~bling barrel model ZAll, for cleaning castings. Lit.
proizv. no.8:10-12 Ag '62. (MIRA 15:11)
(Foundries--Equipment and supplies)
(Metal cleaning) (Automation)

GITEL'MAN, L.Sh., inzh.; LITVIN, D.M., inzh.

Automatic gravity die casting machine for making aluminum
tractor engine pistons. Lit. proizv. no.11:15-19 N '65.
(MIRA 18:12)

GITEL'MAN, M.B.

In the technical economic committee of the Omsk Economic Council.
Biul.tekh.-ekon.inform.Gos.nauch.-issl.inst.nauch. i iskh.inform.
no.6:86-87 '62. (MIRA 15:7)

(Omsk Province—Industry)

GITEL'MAN, M.B.

Saving ferrous and nonferrous metals in enterprises of the Omsk
Economic Council. Biul.tekh.-ekon.inform.Gos.nauch.-issl.inst.nauch.
i tekh.inform. no.8:83 '62. (MIRA 15:7)
(Omsk Province—Metals, Substitutes for)

NIKITINA, A.I.; GITEL'MAN, V.M.

Docent Lazar' Moiseevich Rozenfel'd; on the 60th year of his medical,
teaching, and public activities. Vest.oto-rin. 18 no.3:87 My-Je '56.
(MLRA 9:8)

(ROZENFEL'D, LAZAR' MOISEVICH)

YUSHIN, A.I.; VODOP'YANOV, V.N.; GITEL'MAN, M.V.; GRODZINSKIY, L.I.

Designing a group of industrial buildings taking into account
the deformation of foundations caused by underground workings.
Prom. stroi. 38 no. 12:35-39 '60. (MIRA 13:12)

1. TSentrogiproshakht (for Yushin). 2. Khar'kovskoye otdeleniye
Promstroyproyekt (for Grodzinskiy).
(Foundations) (Industrial buildings)

CITEL'KH, I. M.

10. GIBL'KH I. M. Osnovnye voprosy teorii i praktiki
vosstanovitel'noy Pary vospaleniya trudy in-ta (Kazansk med.-in lei in-t ortopedii i
vosstanovit khirurgii) t.111,1949, s. 331-42.

SO: LETOIL. JHURNAL STIM Y - Vol. 26, Moskva, 1949

ACCESSION NR: AR4034481

S/0058/64/000/003/E053/E053

SOURCE: Ref. zh. Fiz., Abs. 3E419

AUTHORS: Gaman, V. I.; Gitel'son, G. M.; Perkal'skis, B. Sh.

TITLE: Effect of a strong field and temperature dependence of inverse current of alloyed germanium junctions

CITED SOURCE: Izv. Leningr. elektrotekhn. in-ta, vy*p. 51, 1963, 19-24

TOPIC TAGS: germanium junction, alloyed germanium junction, pn junction, collector current increment, inverse current, inverse characteristics, surface state filling, carrier multiplication

TRANSLATION: The static inverse characteristics of the p-n junction and the increment of the collector current (ΔI) for a given emitter current were investigated in Ge transistors, while the temperature

ACCESSION NR: AR4034481

dependence of the inverse current I_3 was investigated in diodes. A decrease in the inverse current with time is observed in the static measurements, and the time of establishment of the inverse current increases with decreasing temperature (T). This is connected with the filling of the slow surface states, which increases the negative surface charge and leads to a decrease in the multiplication on the surface. This also explains why ΔI is smaller in the static mode than in the pulsed mode. An investigation of the temperature dependence of I_3 shows that the $I_3(T)$ curve has a maximum in the region of below-zero temperatures, at voltages close to breakdown. The increase in I_3 is attributed to multiplication of the carriers on the p-n junction surface at low temperatures. The reason for the appearance of the maximum on the $I_3(T)$ curve remains unclear. G. Stepanov.

DATE ACQ: 10Apr64

SUB CODE: PH

ENCL: 00

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GITELSON, I.I.

See also: GITELSON.

GLADKIKH, A.N., kand.tekhn.nauk; STETSSENKO, B.A.; GITEL'SON, N.I.

Improving the quality of the steel used for cold upsetting.
Stal' 21 no.8:758-761 Ag '61. (MIRA 14:9)

1. Gor'kovskiy politekhnicheskii institut i inzhenerno-tekhnologicheskii i nauchno-tekhnicheskii institut Gor'kovskogo sov-narkhoza.

(Steel--Metallorgprahy) (Forging)

GITEL'SON, S.M., inzhener.

Arrangement of capacitors for increasing the power factor in main
networks of industrial plants. Prom.energ.ll no.4:29-33 Ap '56.

(Condensers (Electricity)) (Electric power distribution) (MIRA 9:7)

GITEL'SON, S.M.; KAYALOV, G.M.

Economic evaluation of methods of increasing $\cos \varphi$ in industrial
plants. Energ. biul. no.5:15-18 My '57. (MLRA 10:6)
(Electric power)

GITLE'SON, Samuil Moiseyevich, dotsent

Theoretic principles of the optimum distribution of condensers at industrial enterprises. Izv. vys. ucheb. zav; elektromekh. 3 no.8: 119-130 '60. (MIRA 13:9)

1. Nachal'mik tekhnicheskogo otdela Rostovskogo otdeleniya Gosudarstvennogo proyektnogo instituta "Tyashpromoelektroproyekt".
(Condensers (Electricity)) (Electric power distribution)

GITEL'SON, Samuil Moiseyevich, dotsent

Choice of condenser voltage for increasing $\cos \varphi$ of industrial enterprises. Izv. vys. ucheb. zav.; elektromekh. 6 no.1:118-123 '63. (MIRA 16:5)

1. Nachr''nik tekhnicheskogo otdela Rostovskogo otdeleniya Gosudarstvennogo instituta po proyektirovaniyu elektrooborudovaniya dlya tyazheloy promyshlennosti. (Electric power distribution)

BYCHKIN, Pavel Vasil'yevich, kand. veter. nauk; GITEL'SON, Sara
Saulovna, kand. veter. nauk; AGABEBOVA, Nina
Beniaminovna, kand. veter. nauk; ZELENKIN, V.S., red.

[Laboratory manual on microbiology] Praktikum po mikrobi-
ologii. Moskva, Izd-vo "Kolos," 1964. 141 p. (B-13 17:0)

GITEL'SON, S.S.

[Rabies in animals and methods of controlling it] Beashenatvo
zhivotnykh i mery bor'by s nim. Moskva, Gos. izd-vo selkhoz. lit-ry.
1953. 15 p. (MLRA 8:1)

(Rabies)

GITEL'SON, TS.I.

Conference of workers of technical and economic laboratories.
Plast.massy no.11:73-74 '61. (MIRA 14:5)
(Plastics—Research)

GITEL'ZON, I.I.; TERSKOV, I.A.; CHUMAKOVA, R.I.; SALANSKIY, N.M.

Bioluminescence of bacteria. Izv. Sib. otd. AN SSSR no.2:
125-126 '62. (MIRA 16:10)

1. Institut fiziki Sibirskogo otdeleniya AN SSSR, Krasnoyarsk.

TARASOV, N.I.; GITEL'ZON, I.I.

Comprehensive investigation of luminescence in the sea during scientific expeditions. Biul. Okean kom. no.8:75-80 '61. (MIRA 15:1)
(Oceanographic research) (Phosphorescence)

GITEL'ZON, I.I.

Biohydrooptics and hydrooptics. Okeanologia 2 no.3:511-513
'62. (MIRA 15:7)
(Marine biology) (Sea water--Optical properties)

G T L 4 1 7
TERSKOV, I. A.; GITEL'ZON, I. I.

Reversion mechanism of hemolysis. Doklady Akad. nauk SSSR
79 no.5:839-842 11 Aug 1951. (CIML 21:1)

1. Krasnoyarsk Medical Institute. 2. Presented 19 June 1951
by Academician A. I. Oparin.

GITELEZON 1.1

USSR.

Investigation of the course of hemolysis by the method of automatic spectrophotometry. T. A. Turyan and I. I. Gital'son (Krasnoyarsk State Med. Inst., Dnepropetrovsk, USSR, 79, 100-2, 1961). An attempt was made to resolve conflicting theories of the hemoglobin (Hb) content of the erythrocytes (r.b.c.) by a spectrophotometric determination of the Hb after hemolysis. Erythrocytes of the blood of healthy people were treated by the use of chemically pure NaCl and double-distilled H₂O. All measurements were made on a solution containing 2 ml. salt water and 50 microl. of blood. The solutions stood 2 hrs. before analysis and absorption curves of Hb were determined by an automatic photometric spectrograph. Hb absorption curves of the series from 0.25% salt to pure H₂O were recorded in the region 300-600 mμ. The time of recording was 4 min.; range, 10-90%. Struma did not appear during centrifugation and a 2-fold effect on the Hb content, 1st, that of light scattering which interferes with the maximum absorption point of the curve, 2nd, Hb released in the struma is identified as dissolved Hb. The av. no. of suspended struma is approximately 50,000 per microl. blood. By assuming that the struma retains up to 10% Hb, the Hb in the suspended struma does not compose more than 0.1% of the content of whole blood. This is within the limit of error for this data. According to the experimental conditions, the suspended struma does not visibly affect the results of the determination of sol. Hb which passed from the r.b.c. into the salt solution within 2 hrs. as shown spectrophotometrically. The quantity of dissolved Hb increased as the concentration of the hemolyzing solution decreased from 0.85% to pure H₂O. Under these conditions no r.b.c. are damaged and the Hb is released; further liberation of Hb can only occur by releasing it from combination with the struma. Thus, the data confirm the existence of a combined form of Hb in the r.b.c. W. H. Fitzpatrick

TEREKOV, I.A.; GITEL'ZON, I.I.

~~SECRET~~
Spectrophotometric studies on reversed hemolysis. Biokhimiia, Moskva
17 no.4:385-391 July-Aug 1952. (CINL 25:1)

1. Krasnoyarsk State Medical Institute.

Exptl data show that there is true reversion of hemolysis in human blood. The max effect is produced by an 0.45% soln of NaCl. The max return of hemoglobin into erythrocytes comprises 60% of hemoglobin that has gone into soln. Stabilization with citrate has no effect on the capacity of erythrocytes to undergo reversion. If the period of storage of preserved blood is prolonged, this capacity is reduced.
PA 236T8

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GITE/20N, I.I

The curves of osmotic hemolysis. L. A. Berkov and T. I. Gileva. *Soviet Medical Journal*, 1953, No. 3, 23-7. *Russk. Zhur. Biol.* 1953, No. 3/05. The resistance of human red blood cells to different concentrations of NaCl was studied by the spectrophotometric method. Dissolved hemoglobin could be recorded even in isotonic solutions, but it was not thought to be connected with hemolysis. The latter sets in immediately as the red blood cells are transferred from isotonic to hypotonic solutions, the rate and intensity of hemolysis increasing as the concentration of the salt is lowered to 0.45-0.40%. Further lowering of the NaCl concentration is accompanied by a slowing in the rate and intensity of hemolysis, but the liberation of hemoglobin continues even below the point of minimal red blood cell resistance. Visual determination of red blood cell resistance is an indicator of the resistance of 100% of the suspended cells. A small percentage of atypical red blood cells exhibit an unusual resistance to hemolysis at NaCl concentrations of 0.45-0.40%. Reducing the NaCl concentration further, especially from 0.3 to 0.0%, again results in a gradual approx. proportional increase in hemolysis of the erythrocytes and a consequent liberation of the part of the hemoglobin which remained bound within the resistant red blood cells. Colloidally suspended cell stroma has no effect on the determination of liberated hemoglobin. Saponin added to red blood cell suspension, already hemolyzed with distilled water, supplemented hemoglobin liberation approx. to an additional 30%. It is concluded that osmotic hemolysis by itself is never complete.

B. S. Lerner

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GITEL'ZON, I. I.

"Investigation of Plood by Objective Spectrophotometric Methods."
Gand Biol Sci, Chair of Anatomy and Physiology Krasnoyarsk Agricultural
Inst, Min Higher Education USSR, Krasnoyarsk, 1955. (KL, No 12, Mar 55)

SO: Sum. No. 670, 29 Sep 55—Survey of Scientific and Technical
Dissertations Defended at USSR Higher Educational Institutions (15)

GITEL'SON, I.I.

USSR/ Medicine - Erythrocytes

Card1/1 Pub. 22 - 56/60

Authors : Gitel'zon I. I., and Treskov, I. A.

Title : The presence in the blood of erythrocyte groups of various stability

Periodical : Dok. AN SSSR 100/4, 821-823, Feb 1, 1955

Abstract : The erythrograms of various patients were studied to determine the changes in distribution of erythrocytes according to stability groups. A study of experimental and clinical changes in the blood system led to a conclusion that the stability of the erythrocyte groups is connected with the physiological state of the organism and changes rapidly during the disturbance of the physiological state. The changes in stability can also be compared with the physiological state of the erythrocytes and their age. Two USSR references (1886-1952). Graphs.

Institution :

Presented by: Academician A. I. Oparin, November 29, 1954

USSR/Human and Animal Physiology. Blood.

T

Abs Jour: Ref Zhur-Biol., No 8, 1958, 36296.

Author : Gitelson, I.I., Terskov, I.A.

Inst

Title : Method of Determination of Hemoglobin Content of Erythrocytes.

Orig Pub: Labor. delo. 1956, No 6, 6-10.

Abstract: The hemoglobin content of a single erythrocyte can be calculated more accurately by data from photoelectric determination (in %) with the aid of erythrohemometer. Hemoglobin values should be expressed in gammas. The average value of Hb content of an erythrocyte in a certain definite age group is fairly constant and is approximately 30 gammas/l erythrocyte. Tables with data are presented, giving average indices of blood in healthy and ill men, distribution of Hb in gammas and count formulas for determination of the color index.

GITELSON,

EXCERPTA MEDICA Sec.2 Vol.9/12 Physiology, et al., 1956

5559. GITELSON I.I. and TERSKOV I.A. Med. Inst. of Krasnoyarsk. *Photo-electric investigation of the stability of erythrocytes

and several results of application (Russian text) FIZIOL. Z. 1956, 42/5 (397-402) Graphs 4

There is a relationship between the number of erythrocytes and light transmission, photoelectrically determined, which can be expressed by the following equation: $\log \frac{1}{T} = K n_e + a$, where T = light transmission, n_e = number of erythrocytes and a = coefficient, dependent on instrumental and experimental conditions. By this method the percentage haemolysis is determined over a range of NaCl concentrations from 0 (water) to 0.85% and a typical distribution contour is obtained. In normal people, 30 to 50% of the erythrocytes are resistant to haemolysis in the narrow range from 0.44 to 0.5% NaCl. In a patient with pernicious anaemia, the distribution was more irregular and extended over a much greater range. Deviations from the normal distribution curve were observed also in other diseases.

Simonson - Minneapolis, Minn.

USSR/Human and Animal Physiology (Normal and Pathological)
Blood. Form Elements.

T

Abs Jour : Ref Zhur Biol., No 6, 1959, 26432

Author : Terskov, I.A., Gitel'son, I.I.

Inst : -

Title : The Method of Chemical (Acid) Erythrograms

Orig Pub : Biofizika, 1957, 2, No 2, 259-266

Abstract : Kinetics of erythrocyte (E) hemolysis (H) was measured by a photoelectric colorimeter (PEC-M). 0.002 n. solution of HCl served as hemolysing solution. Time count of H on colorimeter was performed every 30 seconds until H completion. The indicators of the apparatus were determined according to an extinction scale. The percentage-wise distribution of disintegrating E depending on time of action of acids produces a curve which is called an erythrogram (EG). Simultaneously with recording of EG, microphotographing of disintegrated E was

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GITEL'ZON, I.I.

TERSKOV, I.A.; GITEL'ZON, I.I.

Dynamics of changes in red blood in acute radiation injuries [with summary in English]. Biofizika 2 no.4:523-535 '57. (MLRA 10:9)

1. Krasnoyarskiy meditsinskiy institut (for Terskov). 2. Krasnoyarskiy sel'skokhozyaystvennyy institut (for Gitel'son)
(RADIATION SICKNESS) (ERYTHROCYTES)

GITEL'ZON, I.I.; TERSKOV, I.A.; LUKANICHEVA, Ye.D.

Qualitative composition of red blood in the newborn; erythrographic study. *Pediatrics* no.11:33-39 N '57. (MIRA 11:2)

1. Iz Krasnoyarskogo gosudarstvennogo meditsinskogo instituta (dir. - dotsent P.Podzolkov)
(INFANTS (NEWBORN))
(BLOOD—ANALYSIS AND CHEMISTRY)

GITEL'ZON, Iosif Isayevich; TERSKOV, Ivan Aleksandrovich

[Erythrograms as a method for the clinical study of the blood]

Eritrogrammy kak metod klinicheskogo issledovaniia krovi.

Krasnoiarsk, Izd-vo Sibirskogo otd-niia Akad.nauk SSSR, 1959.

246 p.

(MIRA 13:9)

(BLOOD--EXAMINATION)

GITEL'ZON, I.I.; TERSKOV, I.A.

Physiological significance of the stability of erythrocytes
in acid media. Izv. Sib. otd. AN SSSR no.6:120-133 '59.
(MIRA 12:12)

1.Institut fiziki Sibirskogo otdeleniya AN SSSR.
(Erythrocytes)

GITEL'ZON, I. I., Doc Med Sci (diss) -- "The composition of red blood under normal and pathological conditions (Investigation using the method of photoelectric erythrograms)". Krasnoyarsk (Tomsk), 1960. 36 pp (Acad Sci USSR, Siberian Dept, Inst of Phys, Laboratory of Biophys, Tomsk State Med Inst), 250 copies (KL, No 15, 1960, 138)

GITEL'ZON, I.I.; TERSKOV, I.A.

Aftereffect reaction in irradiated erythrocytes. Biofizika 5
no. 2:180-182 '60. (MIRA 14:4)

1. Institut fiziki AN SSSR, Krasnoyarsk.
(ERYTHROCYTES)
(GAMMA RAYS—PHYSIOLOGICAL EFFECT)

GITEL'ZON, I.I.; TERSKOV, I.A.

Changes in the state of erythrocytes of preserved blood as revealed
by erythrography. Probl. gemat. i perel. krovi 5 no. 5:31-39 My '60.
(MIRA 14:1)
(BLOOD—COLLECTION AND PRESERVATION) (ERYTHROCYTES)

GITEL'ZON, I.I.; TERSKOV, I.A.

Mechanism of hemolysis. Vop.biofiz., biokhim. i pat.erit. no.2:
3-10 '61. (MIRA 16:3)

(HEMOLYSIS AND HEMOLYSINS)

TERSKOV, I.A.; GITEL'ZON, I.I.

Distribution of erythrocytes according to their resistance in
equilibrium or nonequilibrium of the erythron. Vop.biofiz., bio-
khim.i pat.erit. no.2:11-29 '61. (MIRA 16:3)
(ERYTHROCYTES) (HEMOLYSIS AND HEMOLYSINS)

GITEL'ZON, I.I.; TERSKOV, I.A.

Regularities in the distribution of erythrocytes according to
their resistance to various hemolytics. Vop.biofiz., biokhim.
i pat.erit. no.2:30-61 '61. (MIRA 16:3)
(ERYTHROCYTES) (HEMOLYSIS AND HEMOLYSINS)

TERSKOV, I.A.; GITEL'ZON, I.I.

Dynamics of the curves of fractional erythrocyte sedimentation.
Vop.biofiz., biokhim.i pat.erit. no.2:107-117 '61.

(MIRA 16:3)

(BLOOD—SEDIMENTATION)

POETOVA, V.T.; GITEL'SON, I.I.; TERSKOV, I.A.

Immune resistance of erythrocytes. Vop.biofiz., biokhim. i pat.
erit. no.2:153-162 '61. (MIRA 16:3)
(ERYTHROCYTES) (IMMUNOHEMATOLOGY)

GITEL'ZON, I.I.; TERSKOV, I.A.

Factors influencing the resistance of the erythrocytes in a
vascular channel. *Top. biofiz., biokhim. i pat. erit.* no. 2:169-
213 '61. (MIRA 16:3)

(ERYTHROCYTES) (IMMUNOHEMATOLOGY)

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CIA-RDP86-00513R0005

1-124445

ACCESSION NR: A01019166

Cell development cycle of 12 hrs. Fluorescence spectrum indicated

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SUBMITTED: 25Oct63

KTOL: 01

800 CODE: IS

NR RIZ SOV: 003

OTHER: 001

End 3/1

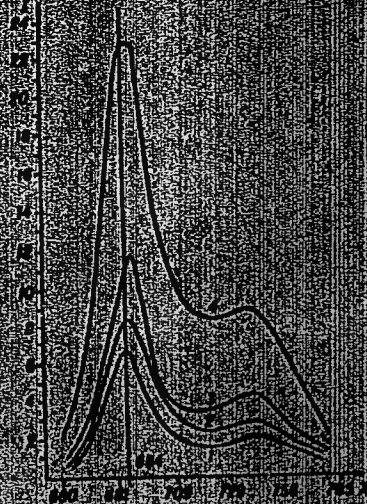


Fig. 3. Fluorescence spectra of *Chlorella* of different ages: 2 hr (1), 6 hr (2), 8 hr (3), and 10 hr (4) cultures.

ACCESSION NR: AT4037716

S/2865/64/003/COO/0472/0476

AUTHOR: Gitel'zon, I. I.; Terskov, I. A.; Batov, V. A.; Baklanov, O. G.;
Kovrov, B. G.

TITLE: Automation of the cultivation of unicellular organisms for use in a
closed ecological system

SOURCE: AN SSSR. Otdeleniye biologicheskikh nauk. Problemy* kosmicheskoy
biologii, v. 3, 1964, 472-476

TOPIC TAGS: closed ecological system, automation, algae cultivation, algae,
air regeneration, manned space flight

ABSTRACT: A self-regulating system designed for controlling algae culture media
is described. It consists of a cultivator for continuous culturing of algae in
a continuously recycled medium. A constant environment is maintained by automatic
regulation of the illumination, CO₂ concentration, temperature, and other factors.
Laboratory experiments have shown that the employment of optimum conditions in an
automatic system can result in a fivefold increase in the rate of biosynthesis of
the tested culture.

ACCESSION NR: AT4037716

ASSOCIATION: none

SUBMITTED: 00

NO REF SOV: 000

ENCL: 00

SUB CODE: PH, LS

OTHER: 000

GITEL'ZON, I.I.; CHUMAKOVA, R.I.; FISH, A.M.

Energy relationships between bioluminescence and respiration of
luminescent bacteria. Biofizika 10 no.1:110-114 '75.

(MIRA 18:5)

1. Institut fiziki Sibirskogo otdeleniya AN SSSR, Krasnoyarsk.

TERSKOV, I.A.; GITEL'ZON, I.I.; SID'KO, F.Ya.; BELYANIN, V.N.; KOVROV, E.G.;
YEROSHIN, I.S.; BATOV, V.A.

Dense continuous cultivation of *Chlorella* in varying illumination.
Probl. kosm. biol. 4:683-686 '65. (MIRA 18:9)

GITEL'ZON, I.I.; BAKLANOV, O.G.; FILIMONOV, V.S.; APPEKIN, A.S.;
SHATOKHIN, V.F.

Bioluminescence as a hydroptic and biological factor in a
sea. Trudy MOIP. Otd. biol. 21:147-155 '65. (MIRA 18:6)

GITEI'ZON, I.I.

Correlation between bioluminescence and chemiluminescence of
biological substrates. Trudy MOIP. Otd. biol. 21:194-195 '65.
(MIRA 18:6)

L 13077-66 EWT(d)/EWT(1)/EWA(j)/T/EWA(b)-2 IJP(c) JK

ACC NR: AP5028917

SOURCE CODE: UR/0020/65/165/003/0692/0695

AUTHOR: Gitel'zon, I. I.; Kovrov, B. G.; Terskov, I. A.

ORG: none

TITLE: Mathematical description of the process of uninterrupted cultivation of water microorganisms

SOURCE: AN SSSR. Doklady, v. 165, no. 3, 1965, 692-695

TOPIC TAGS: microbiology, biologic ecology, mathematic method

ABSTRACT: Due to the increased use of uninterrupted cultivation of microorganisms, it became important to develop a strictly quantitative description of such processes. The mathematical approach proposed by numerous authors describes the process usually by the dependence of the growth rate and cell multiplication on external and internal parameters. The present article follows a different, so-called "population" approach, in which the object of the analysis is the cell population viewed as a whole. The continuous culture is defined as a process satisfying the equation

$$v_1 = v_2 \neq 0,$$

(1)

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UDC: 576.809.33

L 13077-66

ACC NR: AP5028917

where v_1 is the rate of transfer of the element with the nutrient medium into the reactor; v_2 is the total velocity of the discharge from the reactor of all the phases involved (cellular biomass, liquid, and gas). The continuity of the process is secured if Equation (1) is valid for each element of the nutrient medium. The author develops the complete theory for the case of static density cultivation, the mathematical condition of which is

$$dD / dt = 0, \quad (2)$$

where D is the biomass concentration in the microorganism suspension. The paper was presented by Academician A. A. Imshenetskiy, 9 Jan 65. Orig. art. has: 20 formulas.

SUB CODE: 06, 12 / SUBM DATE: 09Jan65 / ORIG REF: 002 / OTH REF: 007

Card 2/2

HW

L 22523-66

EWI(1)/T

UK

SOURCE CODE: UR/0220/65/034/006/1086/1091

ACC NR: AP6C01630

AUTHOR: Gitel'zon, I. I.; Fish, A. M.; Chumakova, R. I.

ORG: Institute of Physics, SO AN SSSR (Institut fiziki SO AN SSSR)

TITLE: Device for studying dynamic metabolism characteristics under conditions of continuous cultivation of microorganisms

SOURCE: Mikrobiologiya, v. 34, no. 6, 1965, 1086-1091

TOPIC TAGS: microbiology, bacteria, biosynthesis, ~~luminescence~~
biologic metabolism

ABSTRACT: A method and apparatus were developed for quantitatively studying static and dynamic aspects of the metabolism of bioluminescent microorganisms cultivated in continuous culture. Long term stationary cultivation under stabilized conditions is achieved by circulating the bacterial suspension in a closed system past monitors for all the regulating parameters--temperature, culture density, and gas feed. When the suspension attains a determined optical density some of it is automatically pumped off and fresh feed added. 3-3 $\frac{1}{2}$ hour runs provided sufficient time for accurate recording of changes in bioluminescence and biosynthesis rates. At the end of the experiments the culture showed no sign of degeneration and no bacterial contamination. Orig. art. has: 5 figures and 1 equation.

UDC: 576.8.095:578.085.9

Card 1/2

"APPROVED FOR RELEASE: Tuesday, September 17, 2002

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~~APPROVED FOR RELEASE: Tuesday, September 17, 2002~~

~~CIA-RDP86-00513R0005~~

L 22523-86

ACC NR: AP6001630

SUB CODE: 06/ SUBM DATE: 07Dec64/ ORIG REF: 002/ OTH REF: 003

Card 2/2. BLG

L 07468-67 EWT(1) SCTB DD

ACC NR: AP6036273

SOURCE CODE: UR/0290/66/000/002/0003/0015

AUTHOR: Gitel'zon, I. I.; Kovrov, B. G.; Terskov, I. A.

ORG: Institute of Physics, Siberian Division, AN SSSR, Krasnoyarsk (Institut fiziki Sibirskogo otdeleniya AN SSSR)

TITLE: Characteristics of the process of continuous cultivation of unicellular algae

SOURCE: AN SSSR. Sibirskoye otdeleniye, Izvestiya. Seriya biologo-meditsinskikh nauk, no. 2, 1966, 3-15

TOPIC TAGS: plant physiology, algae, life support system, photosynthesis, plant metabolism, plant development

ABSTRACT: Equations reflecting the various quantitative characteristics of the continuous cultivation of unicellular algae are developed and rationalized. This comprehensive article is broken down into the following sections: 1) classification of cultivation processes; 2) fundamental equations for a continuous, stable-density culture; 3) change in the elementary composition of cells; 4) instability of biomass concentration during a stationary process; 5) the gaseous nutrition of algae; 6) water loss due to evaporation; 7) change in the volume of a suspension during cultivation; 8) accumulation of metabolites in a culture medium; 9) the quasi-continuous process. Orig. art. has: 43 formulas.

SUB CODE: 06/ SUBM DATE: 22Jan66/ ORIG REF: 001/ OTH REF: 008/ ATD PRESS: 5104
Cord 1/1 UDC: 582.26:502

GITEL'SON, Samuil Moiseyevich, dotsent

General solution of a problem on the optimum distribution of
condensers in systems consisting of transformer-main line
blocks. Izv. vys. ucheb. zav.; elektromekh. 7 no.7:901-907 '64.
(MIRA 18:5)

1. Nachal'nik tekhnicheskogo otdela Rostovskogo otdeleniya
Gosudarstvennogo instituta po proyektirovaniyu elektrooboru-
dovaniya dlya tyazheloy promyshlennosti.

GITEL'ZON, Ya.M., inzh.; POGREBETSKAYA, T.M., inzh.; YURENSEN, A.A., dots.

Nitrogenizing EI723 and 15Kh11MF steels for operation at elevated
temperatures. Energomashinostroenie 4 no.7:32-35 J1 '58.
(Case hardening) (MIRA 11:10)

DYUL'GER, T.B.; KIRIYENKO, G.K.; GITENSHTeyN, B.M.

Testing the crown cork lining for beer bottling. Spirt.prom. 29 no.5:
17-20 '63. (MIRA 17:2)

1. Moldavskiy nauchno-issledovatel'skiy institut pishchevoy promyshlennosti
(for Dyul'ger, Kiriyeuko). 2. Kishinevskiy pivovarennyy zavod (for Giten-
shteyn).

SARAYEVA, M.V.; GITER, N.M.; PODVERBNAYA, M.S.; CHUGUNOVA, M.I.

Reduce the great variety of grades in canned food.
Kons. i ov. prom. 16 no.6:34 Je '61.

(MIRA 14:8)

1. Kamyshinskiy konservnyy zavod.
(Food, Canned)

GITER, Ye.L.

Conditioned reflexes following exclusion of visual stimuli.
Vopr.fiziol. no.9:29-32 '54. (MIRA 14:1)

1. Gorodskaya bol'nitsa g. Roven'ki, Voroshilovgradskoy obl.
(REFLEX, CONDITIONED,
eff. of exclusion of visual stimuli)

ROYTER, I.M.; KOVALENKO, A.Ya.; BERZINA, N.I.; GITERMAN, F.L.

Investigating the technology of preparing dough containing the
scalded flour leavened with thermophile lactic acid bacteria.
Izv.vys.ucheb.zav.; pishch. tekhn. no.6:58-65 '61. (MIRA 15:2)

1. Kiyevskiy tekhnologicheskii institut pishchevcy promyshlennosti,
kafedra khlebopekarnogo proizvodstva.
(Dough)(Lactic acid bacteria)

GITERMAN, G. [Hiterman, G.], inzh.

How to construct buildings with brick vaults without using wooden
construction elements. Sil'. bul. 10 no.9:14-16 S '60.

(MIRA 13:8)

(Farm buildings)

(Building, Brick)

GITERMAN, G., inzh.

Site for the manufacture of precast reinforced concrete products for rural construction on the ND-60-s unit. Bud. mat.
i konstr. 4 no.2:42-44 Mr-Ap '62. (MIRA 15:9)
(Precast concrete)

GITERMAN, G., inzh.

"Handbook for the rural construction worker" by IE.L.Koliko.
Reviewed by G.Giterman. Sil'.bud. 12 no.4:23 Ap '62.
(MIRA 15:8)
(Building--Handbooks, Manuals, etc.) (Koliko, IE.L.)

GITERMAN, G. [Hiterman, H.], irzh.

How to make a shower installation with rapid heating of water.

Sil'.bud. 13 no.10:23 0 '63.

(MIRA 17:3)

SUBJECT USSR / PHYSICS
AUTHOR GITERMAN, M.S.
TITLE The "Smoothing" of Charge Density in the Theory of Polarons.
PERIODICAL Zurn.eksp.i teor.fis, 30, fasc.5, 991-992 (1956)
Issued: 8 / 1956 reviewed: 10 / 1956

CARD 1 / 2

PA - 1396

In the theory of polarons (I.S.PEKAR, Investigations concerning the Electronic Theory of Crystals, Gostechizdat, Moscow 1951) an "auxiliary equation" for the "smoothed" wave function $\varphi(r)$ is to be solved:

$(-\hbar^2/2\mu) \Delta + W) \varphi = E \varphi$; $\varphi = \sum_{\vec{k}} a_{\vec{k}} e^{i\vec{k}\vec{r}}$. Here μ denotes the effective mass of the electron and the polarization potential $W(\vec{r})$ is not computed from the true

function $\Psi(\vec{r}) = \sum_{\vec{k}} a_{\vec{k}} \Psi_{\vec{k}}(\vec{r})$ of the polaron ($\Psi_{\vec{k}} =$ BLOCH functions), but from the smoothed function $\varphi(\vec{r})$. This smoothing, however, causes a certain error committed as regards the amount of energy. This error is here estimated for the case that the limit of applicability of the method of the effective mass $r_p \gg a$ is reached. (r_p - polarization radius, a - distance between the nearest ions).

The error, which is computed by the perturbational theory, is at first explicitly given. The dispersion of the crystal and the dependence of its polarization on the wave length are here neglected. On the basis of the approximation of strongly coupled electrons it was found to apply that: $\Psi_{\vec{k}} = \sum_{\vec{n}} e^{i\vec{k}\vec{n}} \Psi_a(|\vec{r} - \vec{n}|)$. Here \vec{n} denotes the center of the cell which is identical with the core of the positive ion.

Zurn.eksp.i teor.fis, 30, fasc. 5, 991-992 (1956) CARD 2 / 2

PA - 396

As an approximating function $\varphi(r) = (\alpha^{3/2} / \sqrt{55\pi}) (1 + \alpha r + (\alpha r)^2/2! + (\alpha r)^3/3!) e^{-\alpha r}$ is then used. On this occasion α is determined by minimizing the corresponding function is as being $\alpha = 0,821(\mu/m)c/a_B$, where a_B is the BOER radius. Next, the terms of the expression for the error are discussed. Numerical computation was carried out for sodium salts and the function Ψ was approximated with sufficient accuracy according to data obtained by V.A. FOK and M. PETRASEN, Phys.Zs. of the Soviet Union, 6, 369 (1934):

$$\Psi_a(r) = 0,727(4\pi a_B^3)^{-1/2} (r/a_B - 1) e^{-0,71r/a_B} E_1 = (0,01873 \cdot 10^{-15} a^2 + 0,0722 \cdot 10^{-32} a^4 + \dots) e^{2\alpha}$$

was obtained. In the case of NaCl crystal $\alpha = 1,109 \cdot 10^8$ and the smoothing of the potential produced a value for energy which is about 15% too low. By using the approximation of strongly coupled electrons the estimate of the error is somewhat increased so that in the case of NaCl this error amounts to about 10 to 12%.

K.B.TOLPYGO, Zurn.eksp.i teor.fis, 21, 443 (1951) took the higher approximations of the method of the effective mass into account, and according to the results he obtained the values for energy determined by this method are too high, particularly those for NaCl which are too high by about 12-13%. Thus these errors are about equal and inversely directioned. This confirms the applicability of the method of effective mass to the computation of energy even if r_p is about 2 or 3 times the amount of a .

INSTITUTION: Mordwinian State Pedagogical Institute, Saransk.

GITERMAN, M.Sh.

"Smoothing" of charge density in the polaron theory. Zhur.eksp. i teor.
fiz. 30 no.5:992-993 My '56. (MLRA 9:9)

1.Mordovskiy gosudarstvennyy pedagogicheskiy institut, Saransk.
(Electrons) (Crystal lattice)

8/11/57, 126-2-23/35
AUTHOR: Gitterman, M. Sh.

126-2-23/35

TITLE: On the many electron theory of ionic crystals.
(K mnogoelektronnoy teorii ionnykh kristallov).

PERIODICAL: Fizika Metallov i Metallovedeniye, 1957, Vol.5, No.2,
pp. 364-367 (USSR)

ABSTRACT: In the present paper a generalization is given of the calculation of the spectrum of elementary excitations in atomic semiconductors given in Ref.1 by S. V. Vonsovskiy et alii. The latter calculation is carried out in the case of ionic crystals. An ideal crystal lattice consisted of two types of sites f and \bar{g} occupied respectively by ions of different sign (taken as stationary) are considered. Calculations are limited to lattices with cubic symmetry. It is assumed that the crystal is formed by two right sub-lattices f and \bar{g} , inserted into each other. Furthermore, it is assumed that in the ground state the electron density distribution is very non-uniform: there are no electrons near \bar{g} and two electrons at each f with an anti-parallel spin orientation in the lowest energy state. Electron degeneracy in f with respect to the magnetic quantum number is not considered. The excitation of the system

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On the many electron theory of ionic crystals.

126-2-23/35

is due to the lowering of the degree of non-uniformity in the charge distribution: part of the electrons from the f (negative) sites move to g sites (positive). Thus, in the ground state half of the sites are "doublets" and the other half "holes" (Ref.2). Excitations are due to the splitting of the "doublets" and the resulting formation of "singlets" which move through the crystal. It is shown that: (1) the elementary excitations formally correspond to the usual conduction electrons and holes of the one electron theory but the present quasi-particles are collective excitations of the whole system; (2) a finite activation energy is necessary for the appearance of the elementary excitations; (3) the energy spectrum of the system is of the zone type; (4) a quadratic dispersion law is obeyed; (5) for systems with the quadratic dispersion law the logarithm of the electrical conductivity depends linearly on the inverse temperature; (6) such quantitative characteristics as the effective mass, band widths etc. are, on this model, functions of very complicated integrals and have not been numerically calculated. The following persons

Card 2/3

On the many electron theory of ionic crystals. 126-2-23/35

collaborated: S. V. Vonnaovakiy, Ye. A. Turov and
Yu. P. Irkhin.

There are 7 references, all of which are Slavic.

SUBMITTED: March 19, 1957.

ASSOCIATION: Ural State University imeni A. M. Gor'kiy.
(Ural'skiy Gosudarstvennyy Universitet imeni A.M.Gor'kogo).

AVAILABLE: Library of Congress.

Card 3/3

56-4-30/52

AUTHOR
TITLE
PERIODICAL
ABSTRACT

GITERMAN, M.Sh., TOLPIGO, K.B.
The Zone Structure of the Energy Spectrum of a Polaron
(Zonnaya struktura energeticheskogo spektra polyarona, Russian)
Zhurnal Eksperim. i. Teoret. Fiziki, 1957, Vol 32, Nr 4, pp 874 - 882
(U.S.S.R.)

First of all the paper under review comments on the state of investigations with respect to the above problem and refers to some relevant previously published papers. This paper, according to their authors, is the first attempt of a quantitative computation of the deepest zones of a polaron.

The approximate method. - Because of the extremely complicated nature of the general problem, the authors investigate in the paper under review a relatively slow motion of the polaron, where it is possible to neglect the transmission of its energy to the crystal. Also the radius of the state of the polaron ($r_0 > a$) is assumed to be sufficiently great in order to enable a consideration of the results of the macroscopic theory by Pekar as zeroth approximation. Even the investigation of a motionless polaron with small radius is an independent and relatively difficult problem. The question under consideration in this paper is reduced to the determination of the explicit dependence $J(\xi)$ and to the integration of the equation $-(\hbar^2/2M) \nabla^2 \psi + J[\psi] \psi = E \psi$. In this context, $J[\psi]$ denotes the energy of a polaron with a motionless polaron,

Card 1/2

The Zone Structure of the Energy Spectrum of a Polaron

ξ stands for the coordinate of the center of mass of the polaron, M denotes the effective mass of the polaron. This dependence is connected with the discrete structure of the crystal. The paper under review solves the Schrödinger equation for the polaron in zeroth approximation. Also the solution of first approximation is given. All self-oscillations of the binary crystals have a certain dipole moment, but as far as the polaron with great radius are concerned, the longitudinal optical branch yields the greatest contribution to the coefficients of expansion in the Fourier expansion of the inertia dipole moment. The paper under review contains formulae for the mean potential energy of the electron, for the potential energy of the deformed crystal and for the energy of a crystal with a polaron.

Subsequent chapters of this paper deal with the dependence of the energy of a crystal with a polaron on the position of the center of mass of the polaron, and they also consider the widths of the polaron zones for concrete crystals. (2 charts).

State University Kiev (Kiev)

ASSOCIATION
PRESENTED BY
SUBMITTED
AVAILABLE
Card 2/2

21 April 1956
Library of Congress

GITERMAN, M. Sh.

AUTHORS: Vinetskiy, V.L., Giterman, M.Sh. 56-3-26/59

TITLE: On the Theory of Interaction between "Superfluous" Charges in Ionic Crystals. (K teorii vzaimodeystviya "lishnikh" zaraydov v ionnykh kristallakh)

PERIODICAL: Zhurnal Eksperim. i Teoret. Fiziki, 1957, Vol. 33, Nr 3, pp. 730-734 (USSR)

ABSTRACT: The interaction between polarons is investigated theoretically. The polarons are the current carriers in an ion crystal and responsible for the electric, photoelectric, and optical properties of these crystals. It is shown that in crystals for which the condition $n^2/\epsilon \leq 0,05$ is satisfied the formation of so-called "bipolarones" is energetically more favorable, they have a limited distance R. Bipolarones are double polarons. These considerations admit to estimate the influence of the interaction of the polarons on the energy of each single one and thus to give the criteria which are necessary for the elimination of such an interaction. This is necessary in order to set up a "many electron theory". There are 3 figures, 1 table, and 6 Slavic references.

ASSOCIATION: Ural State University. (Ural'skiy gosudarstvennyy universitet)

SUBMITTED: March 12, 1957.

AVAILABLE: Library of Congress

Card 1/1

AUTHOR: Gitterman, M. Sh., SOV/126-6-5-27/43
TITLE: Allowance for Interaction of Current Carriers with the
Ion Lattice in the Many-electron Theory of Ionic
Crystals (K uchetu vzaimodeystviya nositeley toka s
ionnoy reshetkoy v mnogoelektronnoy teorii ionnykh
kristallov)

PERIODICAL: Fizika Metallov i Metallovedeniye, 1956, Vol 6, Nr 5,
pp 930-932 (USSR)

ABSTRACT: The author (Ref 1) discussed the following simple
model of an ideal ionic crystal: in the ground state
there are no electrons at type g sites, while at each
type f site there are two electrons with their spins
in opposite directions. The author dealt in Ref (1) with
the energy spectrum of weakly excited states of such a
system, which were due to decrease of non-uniformity
in charge distribution and appearance of fundamental
excitations, corresponding to "conduction electrons" in
the one-electron model. The electron and lattice sub-
systems were regarded as independent systems and their
interaction was neglected. The present paper deals with
the energy spectrum of weakly excited states of an ionic
crystal (using the model described above) in the case of

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SOV/126-6-5-27/43

Allowance for Interaction of Current Carriers with the Ion
Lattice in the Many-electron Theory of Ionic Crystals

a strong coupling between electrons and the ion lattice. Deformation and displacement of ions, due to the electric field of moving charges, is allowed for in the Hamiltonian of the system. The Hamiltonian of the system has initially a form given by Eq (1), where \hbar is Planck's constant; the first term is the electron kinetic energy operator; the second term represents the potential energy of electrons in the periodic field, due to nuclei and internal electrons of the ions; the third term represents the interaction between electrons; the fourth term gives the interaction of the electrons with inertial polarisation of the crystal produced by the electrons themselves; the last term is the operator which represents normal vibrations of the crystal ions. The fourth term of Eq (1) can be written in the form given by Eq (2) using the dielectric continuum approximations of Pekar (Ref 2).² In Eqs (1) and (2) m is the electron mass, n^2 is the square of the refractive index, κ and ω_n are the wave vector and the phonon frequency

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Allowance for Interaction of Current Carriers with the Ion
Lattice in the Many-electron Theory of Ionic Crystals

respectively, $\epsilon(\omega_k)$ is the dielectric constant and $C_k = (1/n^2) - (1/\epsilon)$. In general, interaction between electrons may affect the interaction of each electron with the lattice vibrations. This correlational effect is assumed to be negligible in the present paper. The final form of the Hamiltonian obtained by the author is given by Eq (7). Physically, transformation of Eq (1) into Eq (7) represents separation of electron and phonon coordinates in Eq (7) by means of the adiabatic approximation. This transformation involves, however, a change in the effective current-carrier mass and the positions of centres of vibrations of the ions. In the adiabatic approximation the eigenvalues of the Hamiltonian of Eq (7) are also energy levels of the whole system and the wave function is a product of the wave functions of the electron and phonon subsystems. The last term in Eq (7) represents free vibrations of the phonon field (the boson branch of the spectrum), and the remaining terms represent the energy of fundamental

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Allowance for Interaction of Current Carriers with the Ion
Lattice in the Many-electron Theory of Ionic Crystals

excitations of the Fermi types E_1 and E_2 . These terms depend not only on the quasi-momenta of fundamental excitations but also on the equilibrium positions of ions and they correspond to the electron and hole polarons in the one-electron theory of Pekar (Ref 2). All the conclusions about the properties of these fundamental excitations given by the author in Ref (1) are also true in the present treatment. Acknowledgments are made to S. V. Vonsovskiy for his advice. There are 6 Soviet references.

ASSOCIATION: Ural'skiy gosudarstvennyy universitet imeni
A. M. Gor'kogo (Ural State University imeni A.M. Gor'kiy)

SUBMITTED: May 27, 1957

Card 4/4

24(5)

SOV/56-35-6-32/44

AUTHORS: Gitterman, M. Sh., Zyryanov, P. S., Taluts, G. G.

TITLE: Bose-Excitations in Ion Crystals (Bozevskiye vzbuzhdeniya v ionnykh kristallakh)

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1958, Vol 35, Nr 6, pp 1532-1537 (USSR)

ABSTRACT: The interaction between exciton and lattice oscillations has already frequently been investigated. Exciton energy and the connection between exciton-phonon interaction and the internal state of the exciton was investigated for strong coupling by S. I. Pekar and I. M. Dykman (Ref 1) as well as by V. A. Moskalenko (Ref 2) who used the method developed by N. N. Bogolyubov (Ref 3); for the case of intermediate coupling it was investigated by I. P. Ipatova (Ref 4) by the method developed by Lee, Low and Pines (Li, Lou, Payns) (Ref 5) and for weak coupling by I. M. Dykman (Ref 6), as well as by Moskalenko (Ref 7) and Haken (Khaken) (Ref 8). The authors of the present paper consider excitons to be elementary excitations in a multi-electron system, which interact with the lattice. The Hamiltonian of the system consists of three parts:

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Bose-Excitations in Ion Crystals

SOV/56-35-6-32/44

$H = H_{el} + H_{ph} + H_{int}$ - the first term corresponds to the electrons, the second to the phonons, and the third describes electron-phonon interaction. The energy spectrum of a weakly excited state of the system is investigated on the assumption that in every node there exists an electron which is either in the ground state ($\lambda = 0$) or in an excited state ($\lambda = 1$). The Bose (Boze) excitations of such a system of electrons (excitons) interacting with polarization vibrations of a crystal are investigated by means of the second quantization representation. First, an expression is derived for the Hamiltonian H_{el} of the multi-electron system, then one for H_{ph} , and finally one for the interaction H_{int} . It is found that in the case of weak coupling the interaction leads to a decrease of exciton energy and to an increase of the effective exciton mass. This is in agreement with the results obtained by Dykman and Moskalenko (Refs 6, 7). In conclusion, a quantitative estimate of these effects is discussed in short. The authors thank S. V. Vonsovskiy for discussing the results obtained. There are 17 references, 12 of which are Soviet.

Bose-Excitations in Ion Crystals

SCV/56-35-6-32/44

ASSOCIATION: Ural'skiy gosudarstvennyy universitet
(Ural State University)

SUBMITTED: July 9, 1958

GITSMAN, M. Sh.: Master Phys-Math Sci (diss) -- "Investigation of ionic crystals by the method of elementary excitations". Sverdlovsk, 1959. 11 pp (Min Higher Educ USSR, Ural State U Im A. N. Gor'kiy), 100 copies (RU, No 11, 1959, 99)

GITERMAN, M.Sh. [Hiterman, M.Sh.]; TUROV, Ye.A. [Turov, IE.A.]

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ABSTRACT: The exciton energy spectrum was considered in Refs 1-3.

In those papers atomic functions were used. In the present note one-particle functions of the molecular type are employed which means that it is possible to introduce explicitly into the exciton energy spectrum both the electron and hole effective masses and to compare it with results obtained by other workers. As in Ref 1 it is assumed that at each lattice point there is on the average only one electron which can be either in the ground state ($\lambda = 0$) or in an excited state ($\lambda = 1$). The Hamiltonian for a system of electrons in a weakly excited state is taken from Ref 1 and is given in Eq (1). The exciton energy is given by Eq (14) and the activation energy and the effective mass of an exciton is given by Eq (15). These equations are identical with those obtained by Takeuti (Ref 5). In

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On the Theory of Exciton Excitations SOV/126-7-2-22/39

the latter paper the exciton problem was considered in the configuration space by the Heitler-London method using molecular type functions. There are 5 references, 3 of which are Soviet, 2 English.

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